

## **REMARKS**

### **I. Introduction**

With the cancellation herein without prejudice of claim 19, claims 18 and 20 to 37, are pending in the present application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

Applicants thank the Examiner for considering the previously filed Information Disclosure Statement, PTO-1449 paper and cited references.

### **II. Rejection of Claims 18 and 28 Under 35 U.S.C. § 112, First Paragraph**

Claims 18 and 28 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. While the present rejection is not necessarily agreed with, to facilitate matters, claims 18 and 28 have been amended herein without prejudice in self-explanatory manner.

In view of the foregoing, it is respectfully submitted that the written description rejection should be withdrawn.

### **III. Rejection of Claims 18 to 37 Under 35 U.S.C. § 103(a)**

Claims 18 to 37 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of U.S. Patent No. 5,680,048 ("Wollny") and Doerksen, *"Improved Optical Positioning for GPR Based Structure Mapping"*, Ninth International conference on Ground Penetrating Radar, Proceedings of SPIE Vol. 4758 (2002), pp. 503-507 ("Doerksen"). It is respectfully submitted that the combination of Wollny and Doerksen does not render unpatentable the present claims as amended herein for at least the following reasons.

As an initial matter, claim 19 has been canceled herein without prejudice, thereby rendering moot the present rejection with regard to claim 19.

Claim 18 has been amended herein without prejudice to recite that a distance sensor is adapted to determine a distance traveled by the radar device as a function of a distance of movement of the radar device. Support for this amendment may be found, for example, on page 5, lines 15 to 21, of the Specification.

Wollny does not disclose, or even suggest, that a distance sensor is adapted to determine a distance traveled by a radar device as a function of a

distance of movement of the radar device. Wollny describes a mine detection system including a wand (102), a housing mounted to the wand (102), a signal processor (201) supported by the wand (102), a ground penetrating radar system (305) in communication with the signal processor (201), and a metal detector system (302) in communication with the signal processor (201). In Wollny, only the current measured result at the existing current measurement location is displayed. A distance traveled as a function of radar movement, and in particular a measurement of a distance traveled by the device is not possible, since the device according to Wollny, is swung freely above a subsurface, without being able to record distance information via a distance sensor.

Doerksen does not cure this deficiency. Doerksen describes an optical positioning system for use in GPR surveys. The system uses a camera mounted on the GPR antenna that takes video of the surface beneath it and calculates the relative motion of the antenna based on the differences between successive frames of video. According to Doerksen, x, y position is calculated “by comparing successive frames of video taken from a camera pointed at the surface, correlating them spatially, and interpolating the distance that the sensor moved. Absolute position is calculated by compensating for the offset between the position sensor and the antenna, and then referencing the relative position to waypoints at known locations to eliminate instrument drift and transform into real world co-ordinates.” (Doerksen, page 503, column 2, first full paragraph). Thus, according to Doerksen, the measurement of the distance traveled is **not a function of the distance that the device moves**, as is the case in the present claim, but rather, is a function of **several other factors**, including, comparing successive frames of video taken from a **camera** pointed at the surface, correlating them spatially, **interpolating** the distance that the sensor moved, compensating for the **offset** between the position sensor and the antenna, and then referencing the relative position to **waypoints** at known locations to eliminate instrument drift and transform.

As such, it is respectfully submitted that the combination of Wollny and Doerksen does not disclose, or even suggest, all of the features included in claim 18. Consequently, it is respectfully submitted that the combination of Wollny and Doerksen does not render unpatentable claim 18, or claims 20 to 27, which depend from claim 18.

Claim 28 has been amended herein without prejudice to be analogous to amended claim 18. As such, it is respectfully submitted that the combination of Wollny and Doerksen does not disclose, or even suggest, all of the features included in claim 28. Consequently, it is respectfully submitted that the combination of Wollny and Doerksen does not render unpatentable claim 28, or claims 29 to 37, which depend from claim 28.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

#### **IV. Conclusion**

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

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Respectfully submitted,  
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